in the revenues of the College. In 1895, Mr. Fowler, his predecessor, appointed a Committee to inquire into the financial position of Coopers Hill, which unanimously reported that the teaching staff of Cooper's Hill was out of all proportion to the number of students they had to teach, but there was then no inquiry made into the efficiency of the education given. Shortly after he became Secretary of State for India he came in contact with various members of the board of visitors, and he was warned that the College was very far from being in a satisfactory state, either as regards teaching or discipline, and that the best thing would be to abolish the College altogether. He declined to do that, and thought they ought to try to improve the College before attempting to abolish it. Nine months after Colonel Ottley became president of the College he presented a report in accordance with the instructions of the India Office. The memorial asked for an inquiry by competent persons. The inference rather was that whatever inquiry had been made was inadequate and had not been made by competent persons. His lordship quoted the names of the gentlemen forming the board of visitors, and mentioned their various qualifications, adding that there had not been a change made in the College that had not had the unanimous approval of the gentlemen to whom he had referred. Those gentlemen had gone through every proposition made to them, and it seemed to him a little unreasonable on the part of Sir Douglas Fox to try to convey to the public what passed at a meeting at which he was not present. The report which Colonel Ottley made showed a very unsatisfactory state of affairs at the College, and he (Lord George) was sorry to have to publish it. It was self-evident that the state of things was such that they could not tolerate. The deputation had come to him because they believed that one-half of the teaching staff had been summarily dismissed. He was afraid, therefore, he must detain them by going through each particular case. The reasons were so self-evident in each particular instance that he thought they would all agree that the Council had no option but to do what they had done. His lordship then gave details of the proposed scheme of retrenchment, mentioning the names of Mr. Reilly, Mr. Hurst and Prof. McLeod, and the gratuities and pension granted them. He now came to the four displacements, which were the result of changes that were to take place in the teaching at Coopers Hill. He had no doubt it would surprise gentlemen to learn that though electrical engineering had made enormous progress in recent years, it was not an obligatory subject at the College, and was hardly taught at all. They proposed to make it a compulsory subject, and to bring in a gentleman of high attainments from outside, who would be assisted by the very best lecturers that could be obtained. These changes necessitated the retirement of Mr. Stocker and Mr. Shields, who would be compensated. The two cases which were left were probably the most important of any of the changes they proposed. Everybody who had looked into the teaching at the College was of opinion that the right course was to place the whole course of engineering in the hands of one professor, with a competent assistant, and that being so, they were bound to appoint to the post the most competent professor for the position. That gentleman was Dr. A. W. Brightmore, and his appointment necessitated the retirement of Mr. Hearson and Mr. Heath, to whom pensions have been granted. The upshot of the whole matter would be this—there would be an increase in the hours of work in class and lecture from twenty-six to thirty-two, that the standard of the entrance examination would be raised, electricity as a subject would be thoroughly taught, outside examiners would be appointed, and the whole course at Coopers Hill would be brought, as far as practicable, into accord with modern engineering requirements. He had stated exactly the reasons and courses which had induced them to take the action they had done, and he thought they would see it was an impossibility for them to reopen the subject, or have a fresh inquiry. The noble lord went on to say: I often wonder how it comes to pass that when we spend so much money on our educational system, which in every branch is the most expensive in Europe, that we attain such unsatisfactory results. In every newspaper devoted to education in recent years there have been complaints by parents and others, pointing out the necessity of improvements if we are to hold our own. What is the main obstacle? What is the great impediment to all educational reform? I pass to a subject on which we shall all be in harmony—the system of education prevalent in our public schools. I read the other day an instructing report drawn up by a gentleman who had thoroughly investigated the system of teaching in force at the preparatory schools for the great public schools, and this was his comment:—"That in these preparatory schools the curriculum in force for boys of from twelve to thirteen is as follows: Hours per week: Eleven for Latin, five for Greek, three-quarters of an hour for English, two for history and geography, three for French, and six for mathematics," and he goes on to say that "this course of study is obviously faulty, though the fault is not with the preparatory schoolmasters, who are quite alive to the need of reform, and prepared to admit it when the public schools, which in this country depend upon the Universities, will allow them to do it." Why will not the Universities and public schools allow this ancient and antiquated system to be changed? Because the personal interests of those who teach classics stand in the way, and if you come to me, then, in the interests of scientific teaching for the future, are you not rather emphasising and accentuating the difficulty that must always face educational reform if the personal interests of those who teach are to be predominant over every other consideration? And there is another consideration which I think will come home to you—that no college is worth maintaining unless discipline and subordination can be infused into the students. I think it is very unfortunate that these gentlemen began to agitate in the way they did. The result has been that the students of the Coopers Hill College have begun to write to the newspapers, and I know of one very improper letter that was repudiated by the older students. I am most anxious to treat all the gentlemen at Coopers Hill College with the utmost consideration, but I am quite determined—and in that I express the unanimous opinion of the Council—that, so long as we are responsible for Coopers Hill College, we are determined to maintain discipline and subordination there. I should be exceedingly sorry if you went away with the impression that we had been harsh or discourteous or arbitrary towards the gentlemen who are to be dismissed; but we entered into a contract which necessitated our giving them notice if we wanted to dispense with their services. We are compelled to give them notice, and I do not see how we could have acted otherwise. I hope always to treat all gentlemen of scientific attainments with the utmost consideration, and to pay all attention to their wants; but it must be self-evident to everybody who dissociates himself from the subject under discussion, that the Government cannot for a moment admit that any gentleman who happens to be engaged in scientific teaching is to have such vested interest in the permanence of the post he holds that he is to hold it regardless of the terms or conditions of the engagement into which he has entered. Such a position is an impossible one, and, therefore, I cannot hold out to you any hope of going back on the decision which has been conveyed to these gentlemen. What we did we did deliberately, and after the fullest examination, and after we had availed ourselves of the advice of the best authorities at our disposal. Any suggestions that may be made by the gentlemen before me with regard to improving the curriculum and time-table at Coopers Hill or enabling the president of the College and the board of visitors to establish harmonious relations with the teaching staff will receive our most careful consideration. But we cannot undo what we have done, and, therefore, though the statements I have made will not be satisfactory to you all, I cannot help thanking you for the interest you have taken in Coopers Hill College, and I hope that if ever it becomes again the subject of discussion between us, I shall be able to show that the changes which we have made will result in improving the utility of the College and bringing it fully up to modern requirements.

Lord Kelvin thanked the noble lord for his courtesy in receiving the deputation, but expressed disappointment at the nature of his reply.

The deputation then withdrew.

NOTES.

PROF. J. A. EWING, F.R.S., has been elected a member of the Athenæum Club under the provisions of the rule which permits of the election of persons "of distinguished eminence in science, literature, the arts or for public services."

THE French Association for the Advancement of Science will hold its annual meeting this year at Ajaccio in Corsica, probably about the middle of September, under the presidency of Dr. Hamy.

WE deeply regret to see the announcement that Prof. Max von Pettenkofer, of Munich, distinguished for his work in hygiene and metabolism, shot himself on Sunday in a fit of depression. He was eighty-three years of age.

THE Institution of Naval Architects has awarded a gold medal to Prof. G. H. Bryan, F.R.S., for his paper on "Bilge Keels," read last year, and printed in abstract in NATURE of June 11, 1900 (vol. lxii. p. 186).

WE learn through the *Lancet* that a disastrous fire has occurred at the Pathological Institute in Berlin, and that the most valuable portion of Prof. Virchow's private museum has been destroyed. The loss of the anthropological collection made in the Philippine Islands by Prof. Jagor is especially regretted.

AT the annual general meeting of the Royal Astronomical Society on Friday last, it was decided by a large majority to hold future meetings at five o'clock instead of eight o'clock as hitherto. Dr. J. W. L. Glaisher, F.R.S., was elected president of the Society. Mr. Choate, the American Ambassador, was present at the meeting, and received the gold medal awarded to Prof. E. C. Pickering.

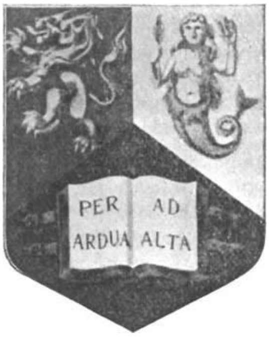
THE Brussels Academy of Sciences has awarded a gold medal, of the value of six hundred francs, to M. F. Swarts, for a memoir on the subject of carbonates of an element the compounds of which are little known. A similar award has been made to Prof. J. Massart, for a memoir on the nucleus of Schizophytes, and the Edouard Mailey prize of one thousand francs, for assistance in the extension of the knowledge of astronomy in Belgium, has been awarded to M. F. Jacobs, the founder of the Société Belge d'Astronomie.

A COMMUNICATION from Prof. A. Newton, F.R.S., relating to some bones of the crane found in excavating the Lynn Docks in the year 1867 or 1868, and now in the Gunn collection in the Castle Museum, was read at the last meeting of the Norfolk and Norwich Naturalists' Society. Prof. Newton gave some interesting information as to the remains of this bird which have been found in the peat of the Fen district, and mentioned other bones in the collections at Cambridge. Mr. Southwell read a paper on the crane in East Anglia, giving a summary of what is known from old authors with regard to the bird as a resident in the Fens, and tracing, as far as he was able, its extinction as an inhabitant. The crane now only visits Norfolk on very rare occasions, at the time of its periodic migrations, the last occurrence being in 1898, when four of these birds visited the neighbourhood of Cley and Runton.

A DEVELOPMENT of Mr. Marconi's system of wireless telegraphy was announced by Prof. J. A. Fleming, F.R.S., on Tuesday, in the course of an address to the members of the Liverpool Chamber of Commerce. Mr. Marconi's private work is carried on chiefly between stations at St. Catherine's, Isle of Wight, and Poole, in Hampshire. The line joining these stations is crossed by the Admiralty line between Portsmouth and Portland, but Mr. Marconi has been able to send and receive two messages simultaneously between his stations without in the least interfering with the Admiralty tests. He has also established a station at the Lizard, in Cornwall, which is 200 miles over sea in a direct line from St. Catherine's. Prof. Fleming said he had Mr. Marconi's permission to announce in public for the first time the result of the latest experiments. Setting up his improved apparatus and a mast 160 feet high, Mr. Marconi accomplished the astonishing feat of sending wireless messages between those two places on the first day of the reign of King Edward VII. Since then Mr. Marconi has established perfect communication without wires between the Lizard and St. Catharine's in both directions, and he can now receive two or more messages at once at each place.

To give men of science and others the opportunity of visiting lands and places of particular interest, a number of cruises have been made in connection with our contemporary, the *Revue générale des Sciences*. The eleventh excursion will be to Sicily, Naples, Pompeii, Salerno, the ruins of ancient Paestum, and neighbouring places, at Easter, the party leaving Marseilles on March 31 and returning on April 16. The scientific guides of the party will be MM. G. Perrot and E. Bertaux, and at each place other distinguished men specially familiar with the objects, buildings, monuments and natural phenomena of interest will cooperate with them. The object of these excursions is more the study of lands and peoples, ancient and modern civilisation, scientific institutions and objects of archæological importance, than casual sight-seeing, and every effort is made to enable the members of each party to derive the fullest advantage from the visits. A programme of the Easter arrangements can be obtained from M. Louis Olivier, *Revue générale des Sciences*, 22, rue du Général-Foy, Paris.

THE accompanying illustration shows the arms recentl granted to the University of Birmingham. The two-headed lion is taken from the arms borne by Sir Josiah Mason, the founder of Mason College, now absorbed in the University, and the mermaid was his crest. The University, having no helmet, needs no crest. Following the usual university precedent, the motto is placed on an open book, and not on a ribbon below the shield. The arms are thus described in the grant:—Per Chevron the Chief per pale Gules and Azure in dexter a Lion rampant with two heads in sinister, a Mermaid holding in the dexter hand a Mirror and in the sinister a Comb Or the base Sable charged with an open book proper with two buckles and straps and edges of the third inscribed "PER ARDUA AD ALTA" of the fourth.



A REUTER correspondent at Cairo reports that Sir John Aird and Sir Benjamin Baker have completed their visit of inspection to the great engineering works at Assuan, where the immense dam to hold up the waters of the Nile is being constructed. The total extent of the dam is one mile and a quarter, of which one mile and an eighth of the foundation is finished. Temporary dams enabling the remaining section to be put in are now carried across the channel. The dam is pierced with 180 openings, about 23 feet high and 7 feet wide, which openings are controlled by stee sluices. The work for the latter is now well advanced. The discharge through these sluices at high Nile may reach 15,000 tons of water per second. The navigation channel and chain of locks are equally advanced with the dam itself, and the lock gates will also be in course of construction in about three months. Unless anything unforeseen occurs the reservoirs will be in operation for the Nile flood of 1903. At Assiut the great regulating dam across the Nile approaches completion, the foundations being practically all in position, leaving a portion of the superstructure to be completed. The sluice openings here number 119, all 16 feet wide. This dam is somewhat similar in principle to the well-known barrage near Cairo, but the details of construction are entirely different, as the foundations are guarded against undermining by a complete line of cast iron and steel-piling above and below the work. The barrage itself is constructed of masonry instead of brickwork as at the old barrage. Although the Assiut barrage is overshadowed by the greater magnitude of the Assuan dam, it will, doubtless, rank second as the monumental work of Egypt.

We have received from the Government Astronomer of Western Australia the meteorological report of the observations made at the Perth Observatory and other places in that Colony during the year 1899. Observations have been made since 1876 in the botanical gardens at Perth, and are still continued; for practical purposes these are very valuable, but since the year 1897 much more complete and trustworthy observations have been made at the new observatory. Most of the outlying stations have been inspected, and the observations now appear to be taken with much more care and regularity than in former years. Owing to the absence of any well-defined natural features, the Colony has been subdivided into one-degree squares, and the rainfall values of each square are shown very clearly in monthly and yearly maps. Other maps show, equally clearly, the mean monthly barometer and temperature, and the mean maximum day and minimum night temperature by the usual method of isobars and isotherms. A set of four platinum resistance thermometers has been sunk in the earth at Perth, and appear to give very satisfactory results. Morning and evening weather forecasts are issued, and have been remarkably correct, the amount of complete success reaching 82 and 89 per cent. respectively.

The Palæontographical Society announces that monographs on the following groups of fossils are in course of preparation, and will be published by the Society: the Carboniferous Lepidodendra, by Dr. D. H. Scott; the Cycadeæ, by Mr. A. C. Seward; the Graptolites, by Prof. Lapworth, assisted by Miss Elles and Miss Wood; the Fishes of the Chalk, by Dr. A. S. Woodward; the Reptilia of the Oxford Clay, by Dr. C. W. Andrews; and the Cave Hyæna, by Mr. S. H. Reynolds. The volume issued by the Society for 1900 contains the Cretaceous Lamellibranchs, by Mr. H. Woods; the Carboniferous Lamellibranchs, by Dr. W. Hind; and the Carboniferous Cephalopods of Ireland, by Dr. A. H. Foord.

Mr. Hugh J. L. Beadnell, of the Egyptian Geological Survey, has published a brief account of the Eocene and Cretaceous series in the Libyan Desert and Nile Valley (*Geological Magazine*, January 1901). He has also expressed his opinion that the Nile Valley in Egypt, hemmed in as it is by lofty cliffs, was in the main brought about by faulting and disturbance in Lower Pliocene times. After the deposition of the Pliocene strata a gradual elevation led to the final retreat of the sea, and the valley then became the site of a series of freshwater lakes. In later Pleistocene times the then youthful Nile commenced its career by carving out a channel in the valley deposits, before, owing to changed conditions, it began depositing layer upon layer of Nile mud.

The pre-Cambrian igneous rocks of the Fox River Valley, Wisconsin, are described by Dr. Samuel Weidman (Wisconsin Geol. and Nat. Hist. Soc., *Bulletin* 3 of Scient. Ser. No. 2). Three areas of these rocks are noted, and they represent various phases from old volcanic flows to masses of deep-seated origin. In the area of the Utley meta-rhyolite, metamorphism has taken place under static conditions, no cleavage is developed, and the alteration has been produced through chemical change without the aid of mechanical deformation. On the other hand, the Berlin rhyolite-gneiss has been subjected to extreme deformation, the original rhyolite being mashed into a gneiss; while the metamorphism of the Wanshara granite has been in part static and in part mechanical, cleavage has been developed and granulation of the quartz has taken place to some extent.

A flora of Staffordshire, by Mr. J. E. Bagnall, is being issued as a monthly supplement to the *Journal of Botany*.

The Report on the Botanic Gardens and Domains, New South Wales, for the year 1899, gives an account of the new herbarium and museum buildings which were erected during that year. The director undertook no less than thirteen botanical explorations during the year, including one of Mount Kosciusco. The botanical results of these expeditions have been published in the *Agricultural Gazette of New South Wales* or elsewhere.

The importance of variations in the osmotic pressure to the phenomena of vegetable life is illustrated in a reprint from the *Botanical Gazette*, by Mr. B. E. Livingston, entitled "On the nature of the stimulus which causes the change in form in polymorphic green Algæ." A series of experiments on a species of Stigeoclonium led him to the conclusion that these changes in form were due to variations in the concentration of the nutritive medium (Knop's solution), and not in any way to changes in its chemical composition.

An important contribution to our knowledge of the flora of North America is issued by the U.S. Department of Agriculture (division of botany), as vol. vii. No. 1 of *Contributions from the U.S. National Herbarium*. It consists of a monograph of the North American Umbelliferæ by Profs. John M. Coulter and J. N. Rose. It enumerates and describes 62 native genera and 332 native species, besides introduced genera and species, the highest previous publication having been 52 native genera and 217 native species. The monograph is illustrated by a number of excellent wood-cuts representing either the general habit or the characteristics of the fruit of the species.

A bilateral division in the parietal bones of monkeys, according to a paper by Dr. Aleš Hrdlička in the *Bulletin* of the American Museum for December 31, seems to be a rare feature.

The October issue of the *Bulletin* of the New Mexico College of Agriculture and Mechanic Arts is devoted to a series of observations and notes on the injurious insects of the country, by Prof. T. D. A. Cockerell.

Dr. W. F. Purcell contributes an important paper on the anatomy of *Opisthopatus cinetipes* to the *Annals* of the South African Museum (vol. ii. part 4). This arthropod, we may remind our readers, is a near ally of the more familiar Peripatus. The author is of opinion that the members of the group met with in Africa may be classified as follows:—(1) Peripatopsis, South Africa; (2) Opisthopatus, South Africa; (3) Peripatus, America, Africa, and possibly India. The distribution of the last-named, in connection with prevalent ideas as to the relationship of the South American and African faunas, is significant.

Mr. J. D. E. Holmes, superintendent of the Civil Veterinary Department, calls attention, in *Bulletin* No. 42 of the Department of Agriculture, Madras, to native beliefs connected with "hair-marks" on horses and cattle. These hair-marks, it appears, are formed by the changes in the direction of the hair on certain parts of the body, and, according to their shape, are denominated a crown, ridge, or feather-mark. Throughout India, but more especially in Madras, the value of a horse or an ox in native estimation depends almost entirely on the presence and situation of certain of these hair-marks. According to native ideas, the old maxim that "a good horse cannot be a bad colour" does not hold good, white, dun, grey, piebald and skewbald animals being much more highly esteemed than those of other colours. A white bullock, again, is held to be of little value, while a black one is regarded as vicious.

SEVERAL popular scientific articles appear in the February number of *Pearson's Magazine*. Mr. R. S. Baker gives a description of some of Sir John Murray's work in oceanography, this being the first of a series on the science of the sea. Mr. Alder Anderson describes Russian Imperial forestry; Mr. T. E. James writes about the remarkable Crater Lake, Oregon; and Mr. T. Morton corrects some mistakes about rainbows in pictures, illustrating his contribution with several good photographs of rainbows. In *Good Words*, Miss G. Bacon describes the Yerkes Observatory; and there are also articles on an ascent of Mount Rainier- the highest mountain in the United States outside Alaska—the effect of light of various wave-lengths upon the growth of plants, the Purbeck marbles, and Miss Mary Kingsley.

IN an address recently delivered to the Chemical Society of the Goldsmiths' Institute, Dr. Julius Lewkowitsch dealt with "The Profession of an Industrial Chemist." The views of Dr. Lewkowitsch, who has had a long experience of manufacturing chemistry both in Germany and in this country, are entitled to very careful attention. He is able to recall the days when in Germany the chemical manufacturer was chiefly a merchant who thought he was marching with the times when he took into his works a young man to act as a testing machine and to become, later on, when he had shaken off the last remnants of chemical knowledge, assistant works manager. Dr. Lewkowitsch points out how entirely this condition of things, which is still prevalent in England, has changed in Germany. His main contention is that that the training which is most effective is that which is most liberal and educationally thorough. He has no grudge against the classics; on the contrary he extols their educational value when properly taught, and he is more solicitous that the school teaching of science should develop the logical faculty than that it should impart a fund of specialised knowledge. In the University period he would have a broad, thorough and unbiased study of chemistry and allied sciences ending, where possible, with some training in the special methods of technological laboratories. He concludes with a very graphic and complete account of the circumstances with which the chemist, so far trained, will have to contend in the works and the conditions necessary for his becoming the scientific master of his surroundings. Dr. Lewkowitsch's address combines high educational ideals with keen appreciation of practical requirements, and it deserves a wide circulation among those who are concerned directly or indirectly with chemical industries.

THE additions to the Zoological Society's Gardens during the past week include a Red-faced Ouakari (*Ouacaria rubicunda*) from the Upper Amazons, presented by Mr. Alfred Hutchinson; a Long-eared Bat (*Plecotus auritus*), a Common Bat (*Vesperugo pipistrellus*), British, presented by Mr. Louis Grundel; a Feline Dourocouli (*Nyctipithecus vociferans*) from South Brazil, a Yellowish Capuchin (*Cebus flavescens*) from South America, two Sharp-tailed Conures (*Conurus acuticauda*) from Paraguay, a Common Waxbill (*Estrelda cinerea*) from West Africa, seventeen Blue-tongued Lizards (*Tiliqua scincoides*) from Australia, deposited; a Sœmmerring's Pheasant (*Phasianus soemmerringi*) from Japan, an Elliot's Pheasant (*Phasianus ellioti*), two Amherst Pheasants (*Thaumalea amherstiae*) from China, a Black-backed Kaleege (*Euplocamus melanotus*) from Sikkim, purchased.

OUR ASTRONOMICAL COLUMN.

VARIABILITY OF EROS.—A circular from the Centralstelle at Kiel calls attention to an important notice from Dr. E. von Oppolzer respecting the planet Eros. He says that Eros shows a variation of brightness of about one magnitude, the change taking place in a few fours. It is in the highest degree desirable that, so far as possible, numerous estimations with neighbouring stars should be made in the course of each night.

CATALOGUE OF PRINCIPAL STARS IN COMA BERENICES CLUSTER.—The sixteenth issue of *Contributions from the Observatory of Columbia University*, New York, contains the discussion and reductions by Mr. W. C. Kretz of a series of measures of this cluster, from photographs obtained by Dr. Rutherford with his 13-inch refractor during 1870–76. The eleven standard stars adopted were reduced from the records of thirty-five catalogues, extending from that of Bradley in 1755 to the Greenwich results, 1887–94. The method of reduction is given in detail with tables of data for determining final positions, concluding with a list of twenty-four stars showing corrected coordinates and proper motions.

UNITED STATES NAVAL OBSERVATORY.—The report of the superintendent of the Naval Observatory at Washington deals with the progress of work during the fiscal year ending June 30, 1900. All the instruments have been in use on every clear night and day.

The 26-inch equatorial has been devoted to observations of difficult double stars, satellites of planets, and a long series of investigations on the use of ocular colour screens for planetary and double star measurements. The double floor, mentioned in a previous report, has undoubtedly improved the working conditions in partly eliminating the variable air currents in the dome. Certain markings have been observed on the disc of Neptune indicating a similarity to the belts of Jupiter.

Photographs of the sun have been taken with the photoheliograph of 40-feet focal length on every fine day, except in April and May, when it was dismounted for use during the total eclipse of the sun. For this eclipse an extensive programme, including spectroscopic, polariscopic and other items, was successfully carried out, the report of which will be ready shortly.

DOUBLE STAR MEASURES.—In the *Astronomische Nachrichten* (Bd. 154, Nos. 3680–1), Dr. Doberck gives a long series of measures of double stars obtained with the 14-inch refractor of the University Observatory, Copenhagen. Comparisons are discussed between the performance of short and long focus instruments with respect to the measurement of close doubles.

SCIENCE AT SHEFFIELD UNIVERSITY COLLEGE.

TWO addresses delivered at the University College of Sheffield on Thursday last, the occasion being the annual distribution of medals, prizes and certificates to successful students of the Technical Department, should be of service to science and technical education in the city. One was by Dr. H. C. Sorby, F.R.S., who during the greater part of the past fifty years has been occupied with scientific research. His remarks on the practical value of scientific theory admit of wide application, and the following report from the *Sheffield and Rotherham Independent* will be read with interest. A valuable address on technical and scientific education was also given by Alderman W. E. Clegg, who in the course of his remarks indicated three directions in which future efforts should be devoted in order to maintain our position in the industrial world; they are:—

(1) Greater energy and enterprise on the part of our manufacturers in utilising to the utmost existing markets, finding fresh ones, seizing every opportunity which presents itself to develop our increasing output and a greater adaptability and suitability of our goods to the requirements of our customers. (2) A closer union and real sympathy between employers and employed, each realising that the interests of the one are bound up in the interests of the other. (3) Greater interest and appreciation of the advantages of a technical and scientific education, and in connection with this all possible facilities should be given to men and boys to enable them to learn the science—the why and wherefore of the particular work they are engaged in—so that they can take an intelligent interest in what they are doing and what they have to do.